

Claims

What is claimed is:

- SUB A' 7
- 5 1. A telephony module for operating in conjunction with a redundant module to form a node in a telephony system, said module comprising:
- a) a network interface; and
 - b) a control system associated with the network interface and adapted to:
 - 10 i) operate in an active mode when the redundant module is inactive and in a inactive mode when the redundant module is active;
 - 15 ii) communicate via the network interface using a first IP address when operating in the active mode;
 - iii) communicate via the network interface using a second IP address when operating in the inactive mode,
- 20 wherein the module represents the node when active using the first IP address.
- 25 2. The telephony module of claim 1 wherein said control system is further adapted to communicate via the network interface using a unit IP address for communications based on said module regardless of being active or inactive.
- 30 3. The telephony module of claim 1 wherein said module is associated with a first hardware address and said control system is further adapted to provide information to at least one device on the network to associate the first IP address with the first hardware address when operating in the active mode.

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4. The telephony module of claim 3 wherein said control system is adapted to broadcast a packet to the at least one device upon switching from the inactive mode to the active mode providing the information to associate the first IP address with the first hardware address.
 5. The telephony module of claim 4 wherein said control system is further adapted to broadcast a gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode to provide the information to associate the first IP address with the first hardware address.
 6. The telephony module of claim 1 wherein the redundant module is associated with a second hardware address and said control system is further adapted to provide information to at least one device on the network to associate the second IP address with the second hardware address of the redundant module when operating in the active mode.
 7. The telephony module of claim 6 wherein said control system is adapted to broadcast a packet to the at least one device upon switching from the inactive mode to the active mode providing the information to associate the second IP address with the second hardware address.
 8. The telephony module of claim 7 wherein said control system is adapted to broadcast a gratuitous ARP request over the network intended to be received by

the at least one device upon switching from the inactive mode to the active mode to provide the information to associate the second IP address with the second hardware address.

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9. The telephony module of claim 7 wherein said control system is further adapted to determine when the redundant module is operational and periodically provide the information to associate the second IP address with the second hardware address to the at least one device until the control system determines the redundant module is operational.

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10. The telephony module of claim 1 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address, said control system further adapted to provide information to at least one device on the network to associate the first IP address with the second hardware address upon receipt of a message having the first IP address and the first hardware address when operating in the inactive mode.

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11. The telephony module of claim 1 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address, said control system further adapted to provide information to at least one device on the network to associate the second IP address with the second hardware address upon receipt of a message having the second IP address and the first hardware address when operating in the active mode.

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12. The telephony module of claim 1 further comprising a computation interface to communicate with a computation module associated with the call processing system, said control system further adapted to communicate with said computation module via the computation interface to allow the computation module to communicate over the network via said module.

13. The telephony module of claim 12 wherein said control system is further adapted to establish a remote socket interface with said computation module via said computation interface.

14. The telephony module of claim 1 wherein said module is associated with a first hardware address and said control system is further adapted to provide information to at least one device on the network to associate the first IP address with the first hardware address prior to sending a message over the network.

15. The telephony module of claim 14 wherein said control system broadcasts an ARP request to associate the first IP address with the first hardware address over the network intended to be received by a device prior to sending the message.

16. The telephony module of claim 1 further comprising a telephony interface for handling circuit-switched traffic and a computation module interface for communication with a computation module to form a peripheral module for a digital switch, said

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telephony module and computation module cooperating to provide call processing.

5 17. The telephony module of claim 1 wherein said control system is further adapted to control a media gateway as part of a media gateway controller.

10 18. A telephony node comprising first and second modules, each module comprising:
a) a network interface; and
b) a control system associated with the network interface and adapted to:
15 i) operate in an active mode when the other module is inactive and in an inactive mode when the other module is active;
ii) communicate via the network interface using a first IP address when operating in the active mode; and
20 iii) communicate via the network interface using a second IP address when operating in the inactive mode,

wherein one of the first and second modules operating in the active mode represents the node and communicates as the node using the first IP address.

25 19. The telephony node of claim 18 wherein said control system for the first module is further adapted to communicate via the network interface using a first unit IP address for communications based on the
30 first module regardless of being active or inactive and said control system for the second module is further adapted to communicate via the network interface using a second unit IP address for

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said first module, and said control system for the second module is adapted to broadcast a second gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode, said second gratuitous ARP request containing the first IP address and a unique hardware address for said second module.

24. The node of claim 18 wherein said control system for the first module is adapted to broadcast a first gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode, said first gratuitous ARP request containing the second IP address and a unique hardware address for said second module and said control system for said second module is adapted to broadcast a second gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode, said second gratuitous ARP request containing the second IP address and a unique hardware address for said first module.

25. A computer readable medium comprising software for a telephony module operating in conjunction with a redundant module to form a node for in a telephony system, said software adapted to instruct the telephony module to:

- a) operate in an active mode when the redundant module is inactive and in a inactive mode when the redundant module is active;

b) communicate via a network interface using a first IP address when operating in the active mode; and

c) communicate via the network interface using a second IP address when operating in the inactive mode,

wherein the module can represent the node when operating in the active mode using the first IP address.

26. The computer readable medium of claim 25 wherein said software comprises further instructions to communicate via a network interface using a unit IP address for communications based on the module regardless of operating in the active or inactive mode.

27. The computer readable medium of claim 25 wherein said software comprises further instructions to associate said module with a first hardware address and provide information to at least one device on the network to associate the first IP address with the first hardware address when operating in the active mode.

28. The computer readable medium of claim 27 wherein said software comprises further instructions to broadcast a packet to the at least one device upon switching from the inactive mode to the active mode providing the information to associate the first IP address with the first hardware address.

29. The computer readable medium of claim 28 wherein said software comprises further instructions to

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broadcast a gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode to associate the first IP address with the first hardware address.

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30. The computer readable medium of claim 25 wherein the redundant module is associated with a second hardware address and further comprising instructions to provide information to at least one device on the network to associate the second IP address with the second hardware address of the redundant module when operating in the active mode.

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31. The computer readable medium of claim 30 comprising further instructions to broadcast a packet to the at least one device upon switching from the inactive mode to the active mode providing the information to associate the second IP address with the second hardware address.

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32. The computer readable medium of claim 31 comprising further instructions to broadcast a gratuitous ARP request over the network intended to be received by the at least one device upon switching from the inactive mode to the active mode to provide the information to associate the second IP address with the second hardware address.

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33. The computer readable medium of claim 31 comprising further instructions to determine when the redundant module is operational and periodically provide the information to associate the second IP address with the second hardware address to the at least one

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device until the control system determines the redundant module is operational.

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- 5 34. The computer readable medium of claim 25 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address and comprising further instructions to provide information to at least one device on the network to associate the first IP address with the second hardware address upon receipt of a message having the first IP address and the first hardware address when operating in the inactive mode.
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- 15 35. The computer readable medium of claim 25 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address and comprising further instructions to provide information to at least one device on the network to associate the second IP address with the second hardware address upon receipt of a message having the second IP address and the first hardware address when operating in the active mode.
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- 30 36. The computer readable medium of claim 25 wherein said module is associated with a first hardware address and comprising further instructions to provide information to at least one device on the network to associate the first IP address with the first hardware address prior to sending a message over the network.
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37. The computer readable medium of claim 36 comprising further instructions to broadcast an ARP request over the network to associate the first IP address with the first hardware address intended to be received by a device prior to sending a message to be handled by the device.
38. A method of providing a node using redundant modules comprising:
- a) operating a first module in an active mode when a second module is inactive and in an inactive mode when the second module is active;
 - b) communicating using a first IP address with an active one of the first and second modules over a network; and
 - c) communicating using a second IP address with an inactive one of the first and second modules over the network,
- wherein one of the first and second modules operating in the active mode may represent the node and communicates as the node using the first IP address.
39. The method of claim 38 further comprising communicating using a first unit IP address for communications associated with the first module regardless of being active or inactive and communicating using a second unit IP address for communications associated with the second module regardless of being active or inactive.
40. The method of claim 38 wherein each of the first and second modules is associated with a unique hardware address, the method further comprising communicating

information from an active one of the first and second modules to at least one device on a network to associate the first IP address with the unique hardware address of the active module.

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41. The method of claim 38 wherein each of the first and second modules is associated with a unique hardware address, the method further comprising communicating information from an inactive one of the first and second modules to at least one device on a network to associate the second IP address with the unique hardware address of the inactive module.

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42. The method of claim 38 further comprising broadcasting a gratuitous ARP request over the network intended to be received by at least one device on a network upon switching from the inactive mode to the active mode, said gratuitous ARP request containing the first IP address and a unique hardware address for an active one of the first and second modules.

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43. The method of claim 38 further comprising broadcasting a gratuitous ARP request over a network intended to be received by the at least one device upon switching from the inactive mode to the active mode, said gratuitous ARP request containing the second IP address and a unique hardware address for the inactive one of the first and second modules.

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44. A telephony module for operating in conjunction with a redundant module to form a node in a telephony system, said module comprising:

- a) means for operating in an active mode when the redundant module is inactive and in a inactive mode when the redundant module is active;
- b) means for communicating via the network interface using a first IP address when operating in the active mode and using a second IP address when operating in the inactive mode, wherein the module represents the node when active using the first IP address.

45. The telephony module of claim 44 wherein said means for communicating is further adapted to communicate using a unit IP address for communications based on said module regardless of being active or inactive.

46. The telephony module of claim 44 wherein said module is associated with a first hardware address and said means for communicating is further adapted to provide information to at least one device on the network to associate the first IP address with the first hardware address when operating in the active mode.

47. The telephony module of claim 46 wherein said means for communicating is further adapted to broadcast a packet to the at least one device upon switching from the inactive mode to the active mode providing the information to associate the first IP address with the first hardware address.

48. The telephony module of claim 47 wherein said means for communicating is further adapted to broadcast a gratuitous ARP request over the network intended to be received by the at least one device upon

switching from the inactive mode to the active mode to provide the information to associate the first IP address with the first hardware address.

5 49. The telephony module of claim 44 wherein the
redundant module is associated with a second
hardware address and said means for communicating is
further adapted to provide information to at least
one device on the network to associate the second IP
10 address with the second hardware address of the
redundant module when operating in the active mode.

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15 50. The telephony module of claim 49 wherein said means
for communicating is adapted to broadcast a packet
to the at least one device upon switching from the
inactive mode to the active mode providing the
information to associate the second IP address with
the second hardware address.

20 51. The telephony module of claim 50 wherein said means
for communicating is adapted to broadcast a
gratuitous ARP request over the network intended to
be received by the at least one device upon
switching from the inactive mode to the active mode
25 to provide the information to associate the second
IP address with the second hardware address.

30 52. The telephony module of claim 50 wherein said means
for communicating is further adapted to determine
when the redundant module is operational and
periodically provide the information to associate
the second IP address with the second hardware
address to the at least one device until the
redundant module is operational.

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53. The telephony module of claim 44 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address, said means for communicating further adapted to provide information to at least one device on the network to associate the first IP address with the second hardware address upon receipt of a message having the first IP address and the first hardware address when operating in the inactive mode.
54. The telephony module of claim 44 wherein said module is associated with a first hardware address and the redundant module is associated with a second hardware address, said means for communicating further adapted to provide information to at least one device on the network to associate the second IP address with the second hardware address upon receipt of a message having the second IP address and the first hardware address when operating in the active mode.